

# **Trends of Public Support Concerning Nuclear Energy in Taiwan (2009-2017)**



**Mei-Ling Hsu**

**(Communication/TIGCR, NCCU, Taiwan)**

**Tsung-Jen Shih**

**(Communication/TIGCR, NCCU, Taiwan)**

**Yie-Jing Yang**

**(Communication, Shih Hsin U., Taiwan)**

**2018 WAPOR-ASIA Annual Conference, Taipei, Taiwan**

**May 25, 2018**

# Objectives of the study

- To analyze the trends of the public support for developing nuclear energy in the contexts of :
  - high dependence on imported energy (98% in 2016),
  - vulnerability to the results of extreme climate conditions, and
  - the opposing positions regarding nuclear energy between political regimes
- To compare factors shaping people's attitudes in Taiwan over time, especially **environmental** and **political** values/ideology
- To suggest future directions in implementing effective risk communication strategies



# Love-hate relationship with nuclear energy

- Nuclear energy is a case of post-normal science, which involves both technical and social concerns
- Nuclear energy has long been a contentious issue for Taiwan
  - Anti-nuclear organized action can be traced back to reaction to Chernobyl accident in 1986, during a time when pro-democracy forces found common cause in opposing the ruling KMT government
  - Halting the construction of the 4<sup>th</sup> nuclear power plant after DPP's Chen Shui-bian won the 2000 presidential election, but short-lived
  - In the years that followed, protests against nuclear energy continued to boil up from time to time, but with limited political consequence
  - 2008 energy policy act prioritized nuclear power as the main supplier of clean energy (under KMT regime)
  - DPP government elected in January 2016 has a policy of phasing out nuclear power by 2025



Nuclear power plants in Taiwan (view)

● Active plants

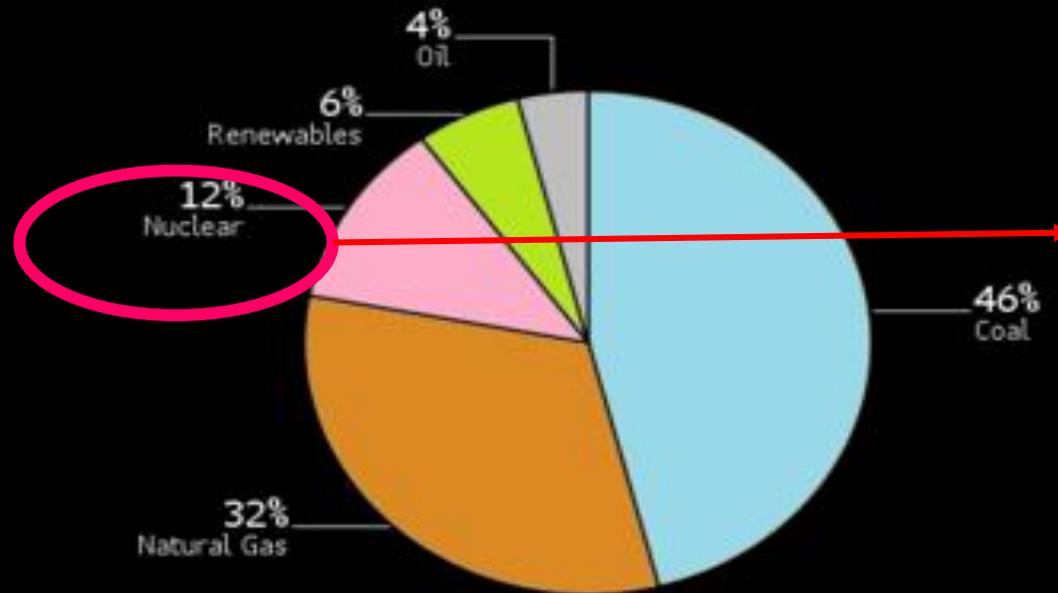
● Halted

# “2025 nuclear-free homeland” energy policy

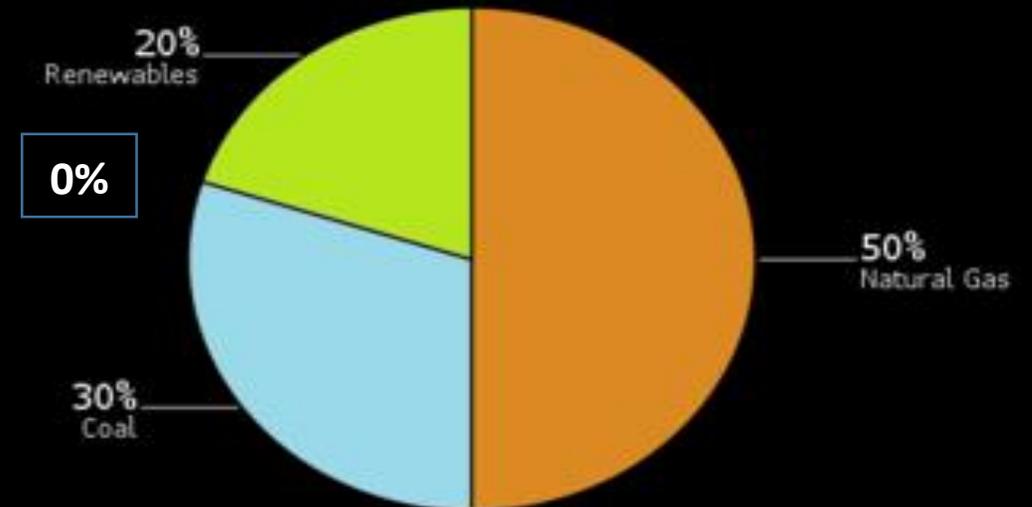
## Taiwan's Energy Shift

Taiwan wants to boost gas and renewable power and reduce coal, nuclear and oil

2016 percent of power generation



2025 goals



Source: Taiwan Bureau of Energy

**Bloomberg**

# Key events during data collection



- Typhoon Morakot (7-9 Aug., 2009)
  - The most devastating typhoon in 50 years
  - Causing more than 600 casualties, destroying several villages, including **completely wiping out a village, Xiaolin**, by mudslides under torrential rain
  - Generating discussions on national land management and preservation policies as well as environmental protection policies in coping with climate disasters



- Fukushima nuclear disasters (11 March, 2011)
  - Due to geographical and cultural proximity of Japan to Taiwan, the disasters have raised awareness of nuclear safety among the Taiwanese public
  - They also **reignited the anti-nuclear sentiment that had been tepid for years**
  - Taiwanese government's pro-nuclear energy policy was soon harshly questioned

- Post-Fukushima anti-nuclear protests
  - Growing public concern over nuclear safety=> **Several large-scale protests were held in Taiwan**
    - March, 2013: 68,000 Taiwanese protested across major cities against the island's fourth nuclear power plant, which is under construction
    - March 2014: Around 130,000 Taiwanese marched for an anti-nuclear protest around Taiwan
  - **The ruling KMT Party agreed to temporarily suspend work on two nuclear reactors but refused to halt the project altogether**

# 2017 Taiwan blackout

- After running for several months with very low reserve margin, which fell below 2% a week earlier, a problem at a large gas-fired power plant **plunged half of Taiwan into darkness for about 5 hours** on August 15, 2017
- The blackout caused **at least US\$3 million of loss or damages** to over 150 companies in industrial parks and export processing zones
- This massive blackout prompted questions about Taiwan's energy policy



## Method:

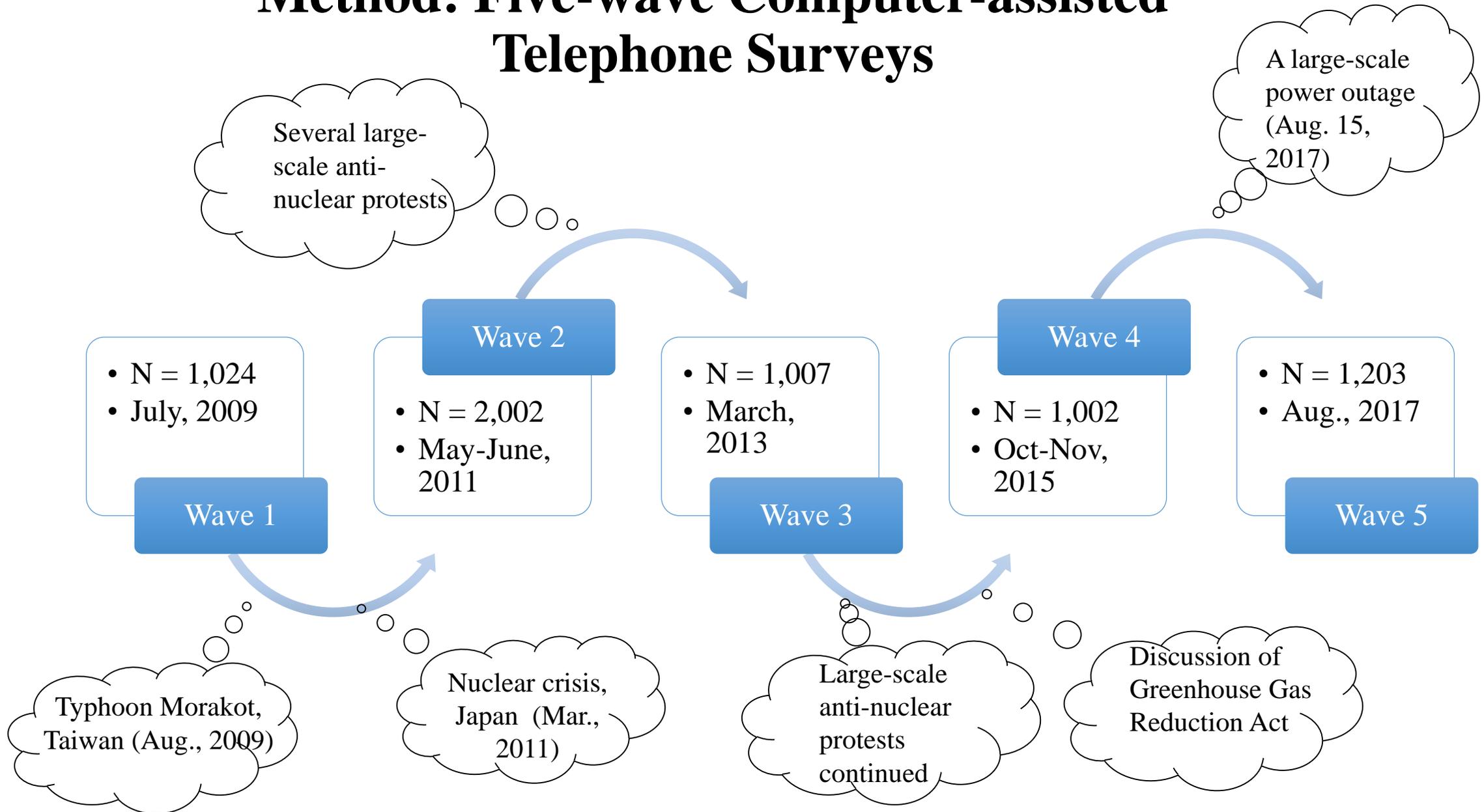
Computer-assisted telephone surveys of Taiwanese citizens aged 18 years and above

Questionnaire researching public perceptions, attitudes and behaviors towards environment, energy use, and climate change

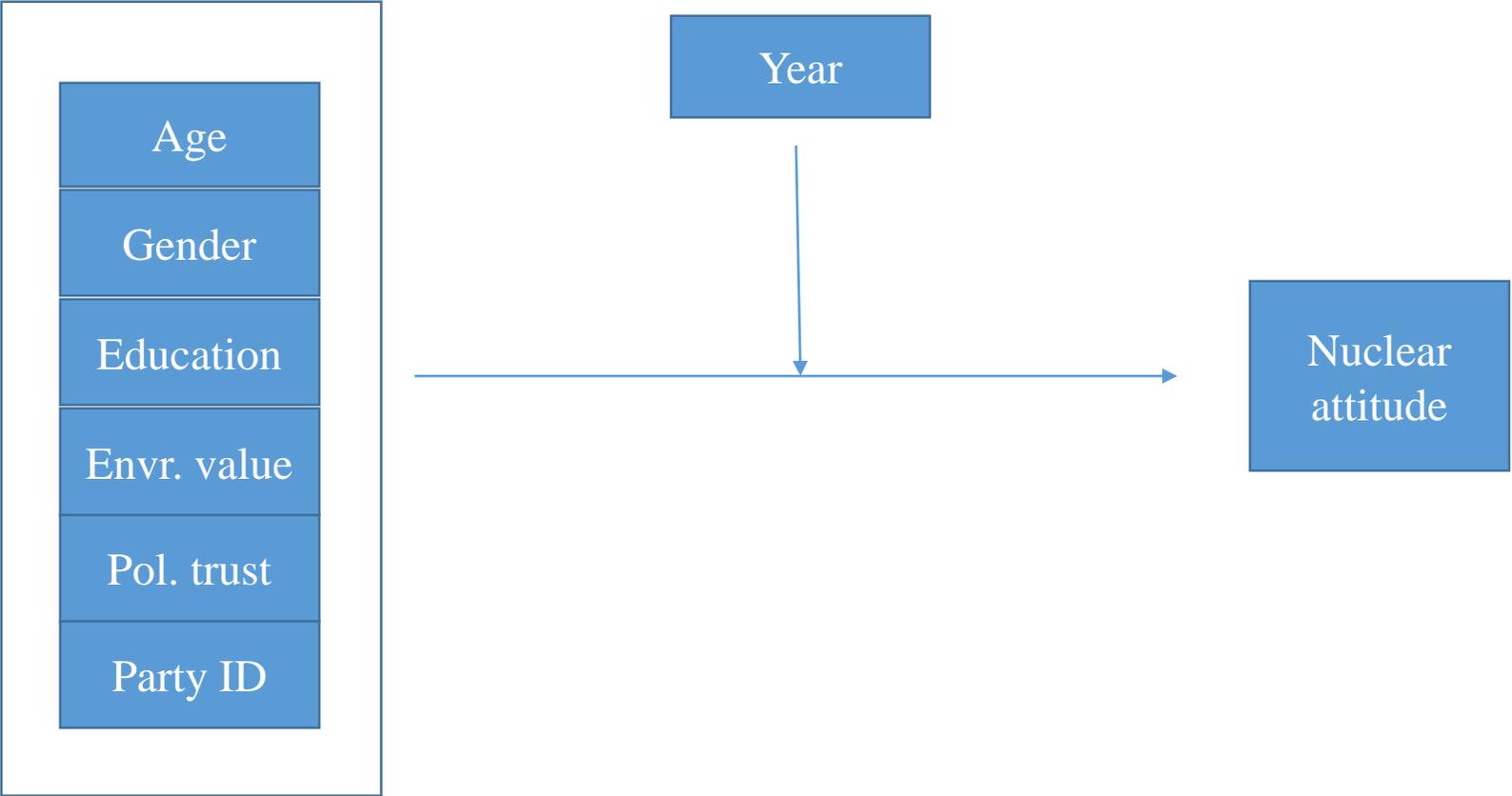
Stratified random sampling was used and random-digit-dialing (RDD) was employed. The last two digits of the selected telephone numbers were randomly generated

The margin of sampling error is plus or minus 2.89%.

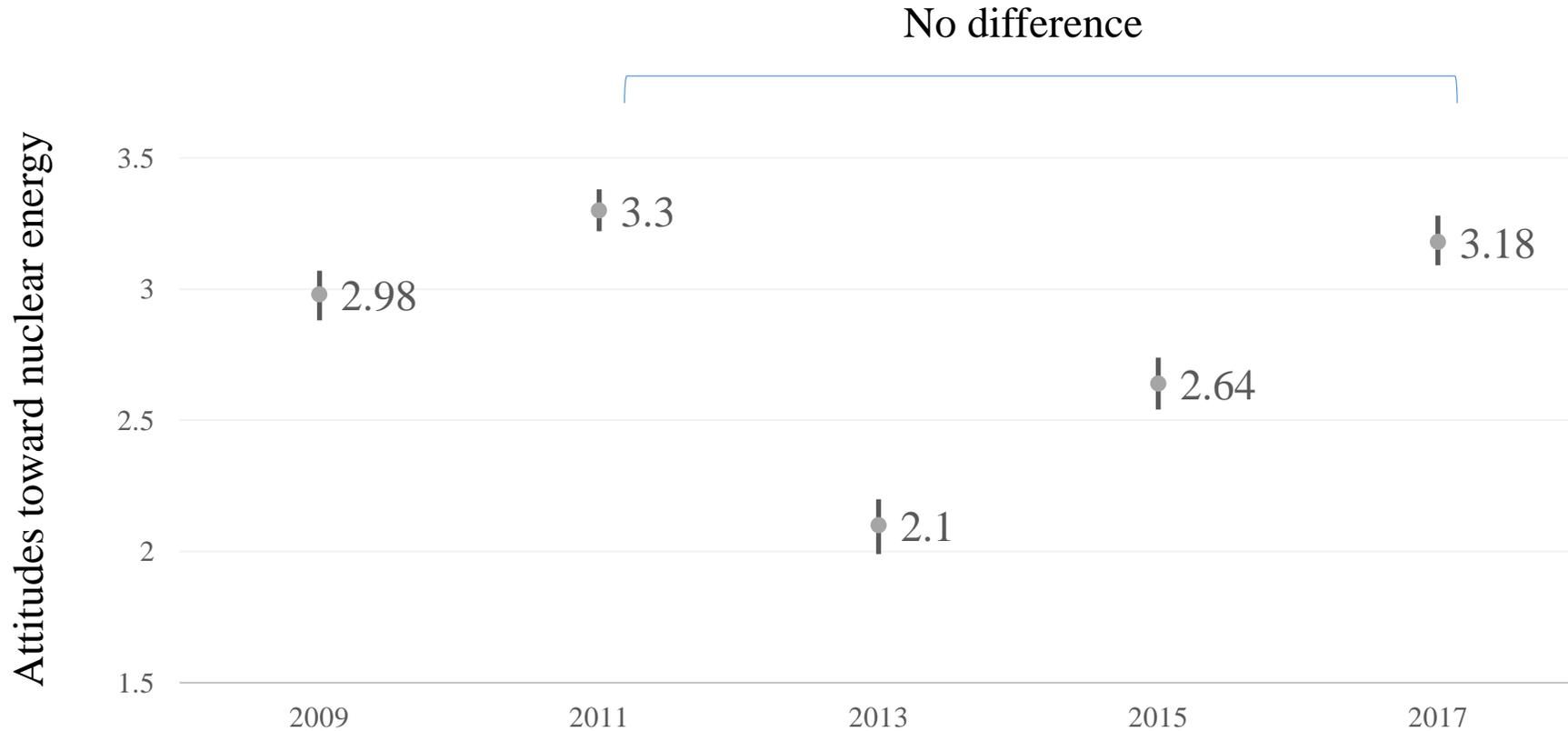
# Method: Five-wave Computer-assisted Telephone Surveys



# Research framework



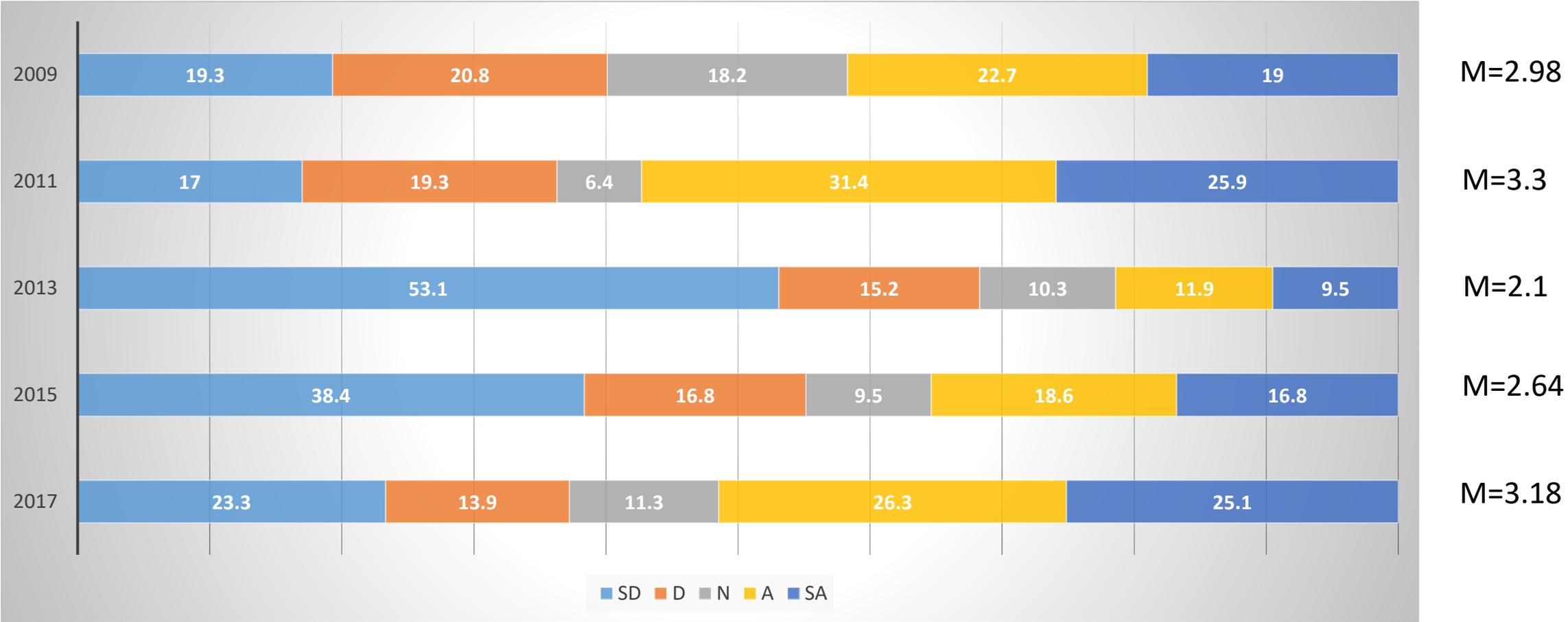
# Public attitudes toward nuclear energy



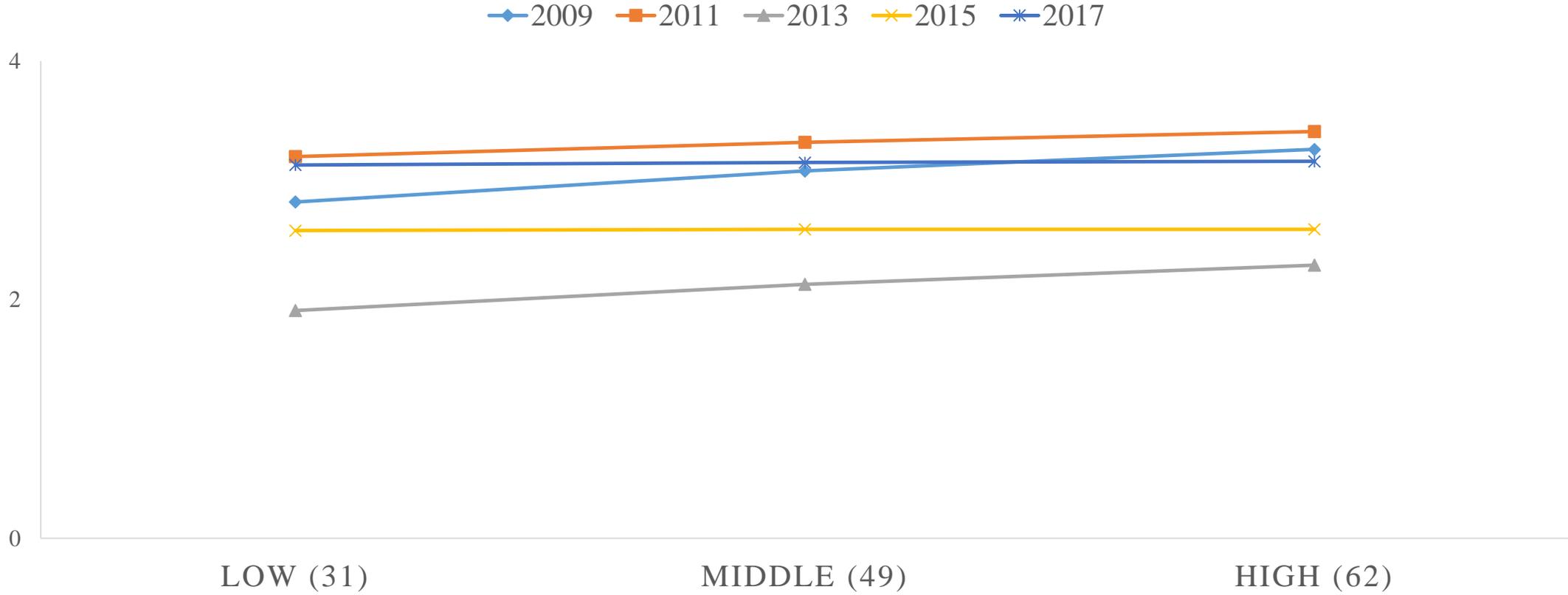
- Measured by 1 item asking whether the respondents support the development of nuclear energy in the country (5-point Likert scale from 1="strongly disagree" to 5="strongly agree" with 3="it depends; don't know")

2009 and 2017 differed,  $p < .05$ ; all the others differed,  $p < .01$

# Percentage distribution of public attitudes toward nuclear energy (%)

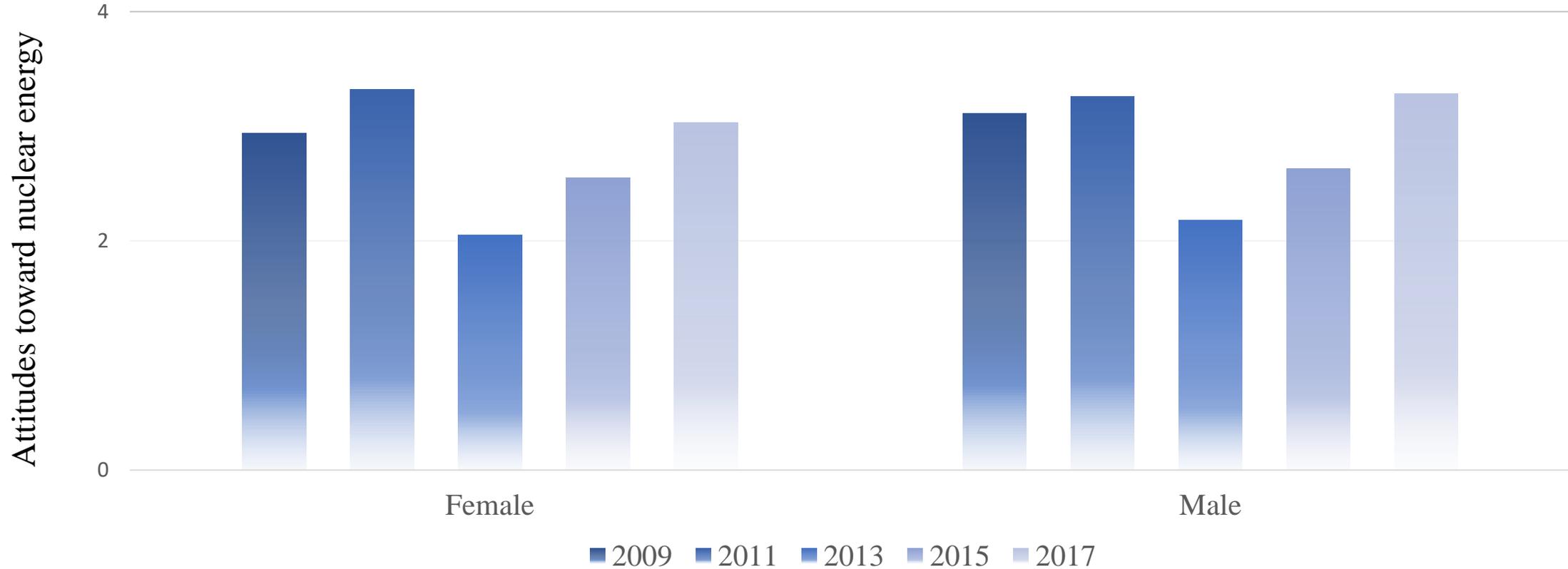


# Age by year



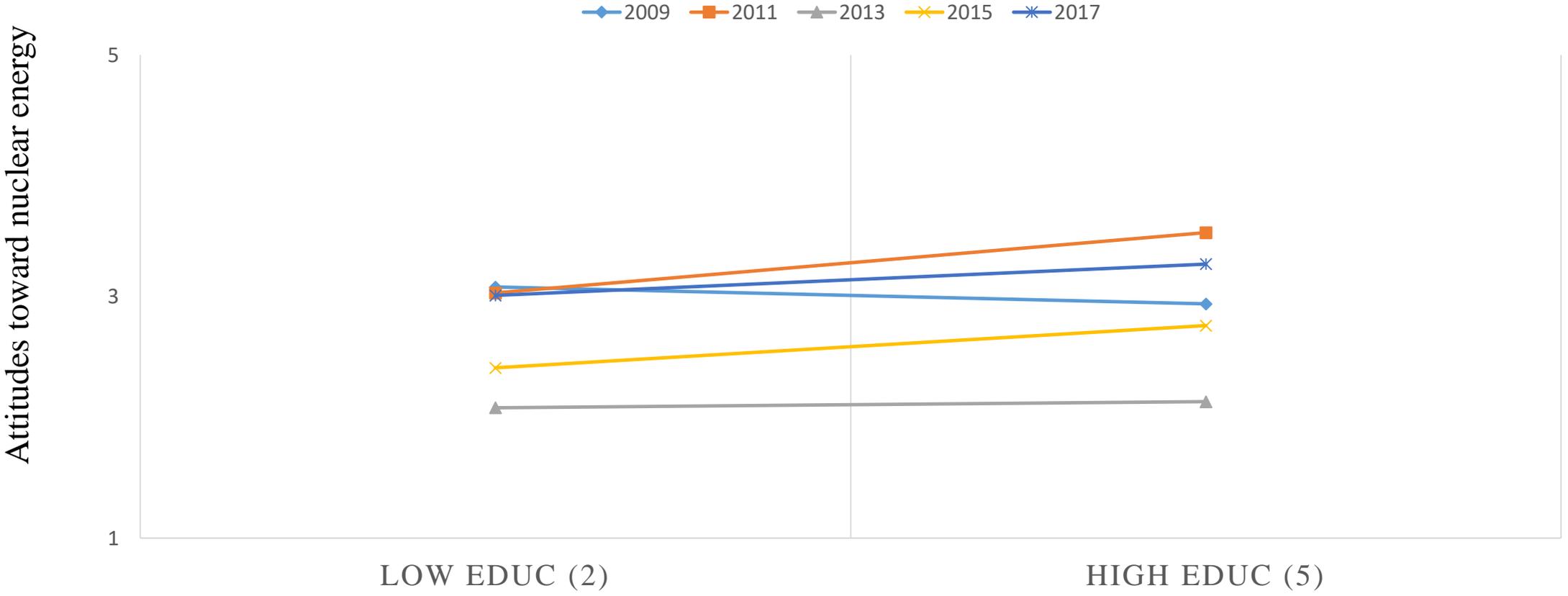
Age exerted positive effects in 2009, but negative effects in 2015 & 2017.

# Gender by year



Men are more likely to support nuclear energy than women in 4 out of 5 years (except in 2011)

# Education by year

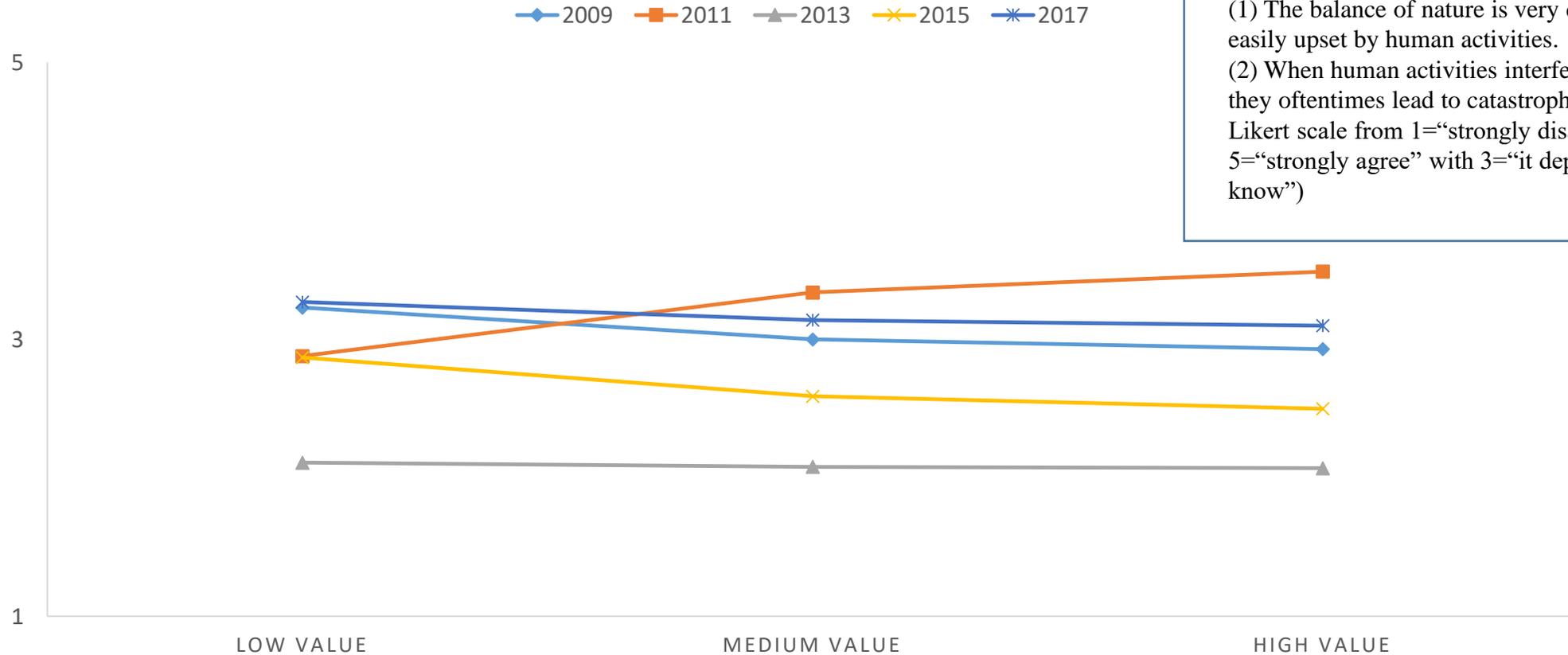


Education exerted a positive effect only in 2011.

# Environmental value by year

- A set of worldviews about the human-nature relationship
- Measured by 2 items modified from the New Ecological Paradigm (Dunlap & Van Liere, 1978) :
  - (1) The balance of nature is very delicate and easily upset by human activities.
  - (2) When human activities interfere with nature, they oftentimes lead to catastrophes. (5-point Likert scale from 1="strongly disagree" to 5="strongly agree" with 3="it depends; don't know")

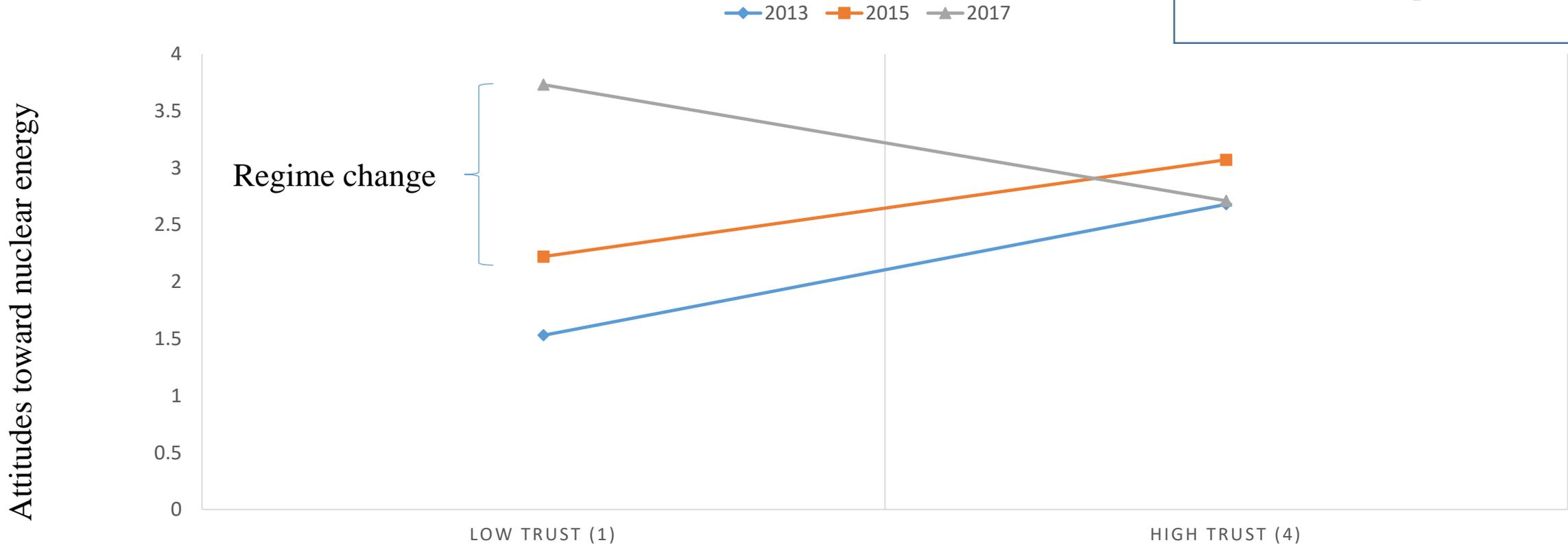
Attitudes toward nuclear energy



Envr. value exerted a positive effect in 2011, but a negative effect in 2015.

# Political trust by year

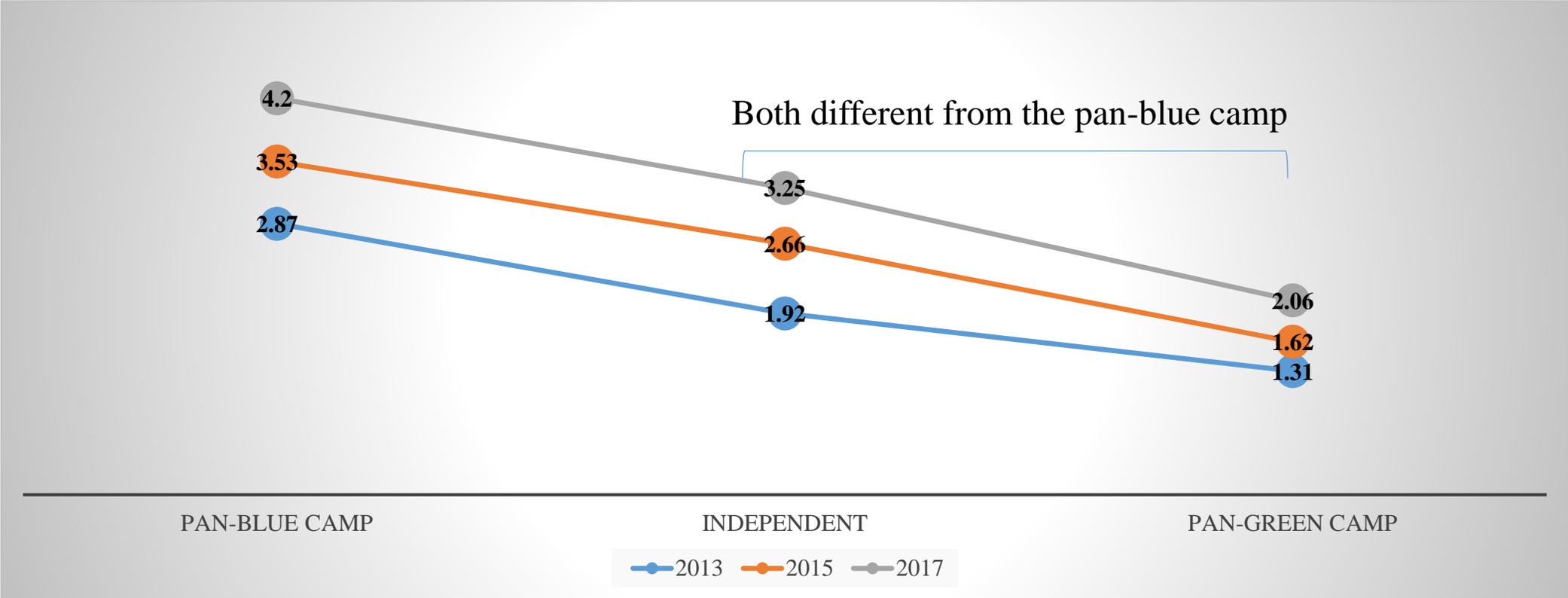
Measured by 1 item: Do you trust the government in coping with climate change (reducing carbon emissions)? (On a 5-point Likert scale from 1="strongly distrust" to 5="strongly trust" with 3="it depends; don't know")



Political trust exerted positive effects in 2013 and 2015, but a negative effect in 2017 due to regime change.

# Party ID by year (2013 and after)

Attitudes toward nuclear energy



In all three years, party preferences were significantly related to public attitudes toward nuclear energy.

# Summary (Regressions)

	2009	2011	2013	2015	2017	IV*Year
Age	.08*	.00	-.02	-.09*	-.11**	F=6.31, p< .01
Gender (Male=1)	.07*	-.01	.12**	.10**	.13**	F=2.07, p>.05
Education	-.01	.14**	.03	.02	-.02	F=6.65, p< .01
Envr. value	-.05	.12**	-.05	-.09**	-.02	F=11.84, p< .01
Political trust	--	--	.21**	.14**	-.17**	F=51.38, p< .01
Party ID-Pan Blue	--	--	.21**	.18**	.23**	F=5.11, p< .01
Party ID-Pan Green	--	--	-.15**	-.26**	-.24**	
R <sup>2</sup>	.02	.04	.17	.18	.22	

# Discussion

- Public support for nuclear energy fluctuated during the five waves of survey, but has restored since 2013
- Demographic variables, environmental value, political trust, and party identification all predicted public attitudes at varying degree along the years
- Nuclear energy is a politicized issue as political trust and party preference served as two consistent predictors of public attitude
- Contextual factors, such as social movements or power outage incidents, may affect public attitudes more than demographics and environmental values
- Intriguing patterns of ‘younger male effect’: Men and younger respondents tended to express more support for nuclear energy (c.p., They also practiced less pro-environmental behaviors)
  - Literature in risk perception (e.g., Slovic and associates) shows that white males and Taiwanese-American males (Palmer, 2010) perceive health and technology risks as low due to individualist and hierachist worldviews as opposed to an egalitarian worldview

*Thank  
You*